

USSR/Nuclear Physics

C-2

Abs Jour : Ref Zhur - Fizika, No 5, 1957, 11053

projected is 50 mm.

In the second model the Lauritsen electrometer is used, making it possible to reduce the dimensions of the instrument and to reduce the weight to 0.5 kg.

Card 3/3

BIBERGAL', A.V.; PERTSOVSKIY, Ye.S.

Selecting the type of irradiator (operating on fission products)  
grain disinfection. Biofizika 1 no.8:696-707 '56. (MLRA 9:12)

1. Institut biologicheskoy fiziki Akademii nauk SSSR, Moskva,  
Institut zerna Ministerstva zagotovok SSSR, Moskva.  
(GRAIN--DISINFECTION) (FISSION PRODUCTS)

BIBERGAL', A.V.

Technique and dosimetry in ionizing irradiations of biological  
objects. Itogi nauki. Biol. nauki no.1:393-435 '57. (MIRA 11:3)  
(RADIOBIOLOGY) (RADIATION--DOSAGE)

· BIBERGAL', A.V.

USSR / General and Specialized Zoology. Insects. P  
Insect and Mite Pests.

Abs Jour : Ref Zhur - Biol., No 10, 1958, No 44899

Authors : Peredel'skiy, A. A.; Rumyantsev, P. D.;  
Bibergal', A. V.; Rodionova, L. Z.; Partsov-  
skiy, Ye. S.

Inst : Not given

Title : The Use of Ionizing Radiations for the Control  
of Insect Pests of Stored Grain.

Orig Pub : Biofizika, 1957, 2, No. 2, 209-214.

Abstract : Laboratory radiation with a 3,000 r dose led to  
a complete or almost complete destruction of  
the eggs and larvae of the rice weevil even  
before they changed into beetles. When 24-29  
day larvae pronymphs and pupae were subjected to  
radiation at 5,000, 8,000 and 12,000 r doses

Card 1/2

AUTHOR BIBERGAL A.V., MARGULIS U.Ya., PERTSOVSIY E.S., PA - 2727  
 TITLE Use of Strong Radiation Sources for the Sterilization of Grain.  
 (Izpol'zovaniye moshchnykh istochnikov izlucheniya dlya obezzyazh-  
 eniya zerna /Russian/).  
 PERIODICAL Atomnaya Energiya, 1957, Vol 2, Nr 4, pp 376-384, (U.S.S.R.)  
 ABSTRACT The authors of the paper under review describe an experimental arrange-  
 ment for the sterilization of grain with the aid of the  $\gamma$ -radiation of  
 $Co^{60}$ . The radiation device has the shape of a hollow cylinder to the  
 generatrix of which there are attached twenty radioactive bars of a to-  
 tal activity of 100,000 g equivalent radium. This device has water pro-  
 tection. The grain is automatically exposed to radiation. The operation-  
 al capacity of the device amounts to 1.85 tons per hour. For the con-  
 struction of industrial plants for the radioactive sterilization of grain  
 the use of  $Co^{60}$  is uneconomical because of the high costs involved. Much  
 more favorable is the utilization of fission products of uranium which  
 are obtained from atomic industry. Because of the low specific activity  
 of the fission products the selection of the most economical configura-  
 tion of the radiation device is the most important problem. According  
 to the computations, cellular (meshed) radiation devices are most fa-  
 vorable. The paper under review discusses three types of such cellular rad-  
 iation devices, namely cylindrical, bar-shaped, and slot-shaped devices.  
 According to the author of the paper, slot-shaped devices can be used  
 most economically because they yield the highest output per unit volu-  
 me of the device. The output of such a radiation device amounts to 31  
 tons per hour at a total activity of 3.72.10<sup>6</sup> Curie. The relatively low

Card 1/2

Use of Strong Radiation Sources for the Sterilization of Grain. PA - 2727

weight of such a device (including the protective device) makes it possible to transport this sterilization apparatus from one grain container to another. So far the translation of the summary of the paper as given by the author of the paper himself. All three types of these radiation devices are discussed in detail. All three types of devices consist of three independent parts which are fitted together only when the radiation takes place- silo, radiation device and mechanism for the removal of the exposed grain. (9 reproductions, 1 Chart).

ASSOCIATION  
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SUBMITTED 2.8.1956  
AVAILABLE Library of Congress  
Card 2/2

A.V. Bidergal, (V.I. Liritsyn)

"GOAL-1-60 IN THE USSR. CONCEPTS FOR THE FUTURE" RESSA-100

by A. V. Bidergal, V. I. Liritsyn

Report presented at 2nd UN Atoms-for-Peace Conference, Geneva, 9-13 Sept 1958

*BIDERGAL, V. I.*

*BIBERGAL, A.V.*

PHASE I BOOK EXPLOITATION

659

Bibergal', Anatoliy Viktorovich and Margulis, Usher Yakovlevich

Atomnyy vzryv i nekotoryye voprosy protivatomnoy zashchity (Nuclear Explosion and Some Problems of Atomic Defense) Moscow, Medgiz, 1958. 68 p. 100,000 copies printed.

ED.: Miklashevskiy, V. Ye.; Tech. Ed.: Bul'dyayev, N. A.

**PURPOSE:** The pamphlet is intended to inform the general public of the characteristics of atomic bombs, to indicate the principal rules to be observed during an atomic attack and to point to possible defensive measures.

**COVERAGE:** The authors claim that in the Soviet Union the use of nuclear power is directed primarily towards constructive purposes, but so long as the use of atomic weapons is not prohibited and the danger of a new destructive war exists, effective measures must be undertaken in times of peace to meet the threat of a sudden atomic attack on large industrial centers. The authors assert that a widespread knowledge of the nature of an atomic war is of

Card 1/4



Nuclear Explosion and Some Problems (Cont.)

659

particular importance under the circumstances. A popular exposition of the elements of nuclear physics is given. Descriptions of atomic explosions and their various forms are taken from published sources, including foreign data only partially available in the Soviet Union. There are 21 diagrams. No personalities are mentioned. There are no references.

TABLE OF  
CONTENTS:

Introduction	3
Ch. I. Basic Concepts of Nuclear Physics	6
Structure of the atom	6
Isotopes	9
Nuclear Forces	11
Radioactivity	12
Nuclear reactions and artificial radioactivity	15
Fission of Uranium	16
Card 2/4	

Nuclear Explosion and Some Problems (Cont.)	659
Ch. II. Atomic Bomb and Atomic Explosion	19
Destructive factors in the detonation of ordinary bombs	
Working principle of the atomic bomb	20
Working principle of the hydrogen bomb	22
Destructive factors of an atomic explosion	24
Ch. III. The Shock Wave and Defense Against it	31
Ch. IV. Luminous Radiation and Defensive Measures	36
The nature of destructive factors of visible radiation during an atomic explosion	36
Burns	40
Fires	42
Defense against luminous radiation	42
Card 3/4	

Nuclear Explosion and Some Problems (Cont.)	659
Ch. V. Radioactive Radiation Generated in an Atomic Explosion and Defensive Measures	44
The nature of radioactive radiation	44
Biological effect of radioactive radiation	45
Severe radiation injury	48
Defense from radioactive radiation	49
Ch. VI. Residual Radioactivity and Decontamination	54
Radioactive contamination	54
Defense from residual radioactivity and decontamination	56
Ch. VII. Rules to be Observed by the Population During an Atomic Attack	61
Conclusion	67

AVAILABLE: Library of Congress

Card 4/4

IS/mtl  
9/26/58

BIBERGAL, A.V.

PHASE I BOOK EXPLOITATION 30V/1297  
Vsesoyuznaya nauchno-tekhnicheskaya konferentsiya po priimeneniyu radioaktivnykh i stabil'nykh izotopov i izlucheniya v narodnoye khozyaystvo i nauku, Moscow, 1957  
Polucheniye izotopov. Moshehorva gama-utanolvi. Radiometriya i dosimetriya; trudy konferentsii. [Isotope Production and Measurement; Transactions of the All-Union Conference on the Use of Radioactive and Stable Isotopes and Radiation in the National Economy and Science] Moscow, Izd-vo AN SSSR, 1958. 293 p. 5,000 copies printed.  
Sponsoring Agency: Akademiya nauk SSSR; Glavnoye upravleniye po ispol'zovaniyu atomnoy energii SSSR.  
Editorial Board: Prolov, Yu.S. (Resp. Ed.), Zhavoronkov, M.M., V.V. Lashchinskiy, M.I. Mal'kov, T.P. Sinitarn, V.I. Popena, G.L. (Secretary); Tech. Ed.: Novichkov, M.D., and others.  
PURPOSE: This collection is published for scientists, technologists, persons engaged in medicine or medical research and others concerned with the production and/or use of radioactive and stable isotopes and radiation.  
COVERAGE: Thirty-eight reports are included in this collection under three main subject divisions: 1) production of isotopes; 2) high-energy gamma-radiation facilities; and 3) radiometry and dosimetry.

TABLE OF CONTENTS:

PART I. PRODUCTION OF ISOTOPES

Prolov, Yu.S., V.V. Boshkarev, and Ye.Ye. Kulish. Development of Isotope Production in the Soviet Union : This report is a general survey of production methods, apparatus, raw materials, applications, investigations, and future prospects for radio isotopes in the Soviet Union. Card 2/12

Isotope Production

Pashkov, V.P., and V.M. Kuznetsov. Low Temperature Methods of Separating Helium Isotopes (He<sup>3</sup> - He<sup>4</sup>) 149

PART II. HIGH-ENERGY GAMMA FACILITIES

Sinitarn, V.I. Problems and Trends in Creating High-Energy Gamma Facilities 160

Bibergal, A.V., U.Ya. Margulis, and V.G. Khushchev. Principles and Techniques of Using Radioactive Isotopes as High-Energy Sources in Radiobiology and Medicine as Basic Problems Concomitant to Planning and Constructing Radiation Facilities are Systematized According to the Purposes of the Facility. Descriptions and schematic drawings are given for some facilities classified as to purpose: a) experimental radiobiology, intended for low radiation of relatively small objects (animals, plants); b) experimental installations intended for radiation of various biological preparations of small size but requiring high dosage (microorganisms, biological substrates); c) industrial radiation of biological products requiring sterilization, preservation, disinfection, etc. d) medical and therapeutic purposes. Card 1/12

175

Portonovskiy Ye.S., A.V. Bibergal', and U.Ya. Margulis. A Pilot Plant Installation for the Radiation Disinfection of Grain 200

*Резюме*  
BIBERGALL', A.V.; KOROTKOV, M.M.; ARAKELOV, O.G.

Gamma irradiation apparatus GUBE-800 for radiobiological experiments  
[with summary in English]. Biofizika 3 no.1:118-122 '58. (MIRA 11:2)

1. Institut biologicheskoy fiziki AN SSSR, Moskva.  
(GAMMA RAYS) (BIOLOGICAL APPARATUS AND SUPPLIES)

PEREDEL'SKIY, A.A., doktor biol. nauk; RODIONOVA, L.Z., nauchnyy sotrudnik;  
BIBERGAL', A.V., kand.tekhn.nauk; RUMYANTSEV, P.D., kand.biol.  
nauk; PERTSOVSKIY, Ye.S., nauchnyy sotrudnik

Developing a method for controlling insect pests of stored grain by  
the use of ionizing radiations. [Trudy] VNIIZ no.35:28-42 '58.

(MIRA 11:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut zerna i produktov  
yego pererabotki (for Peredel'skiy, Rodionova, Rumyantsev, Pertsovskiy).
2. AN SSSR (for Bibergal').

(Radiation sterilization) (Grain--Diseases and pests)  
(Weevils)

BIBER GALT, A.V.

PLANE A BOOK EXHIBITION 807/2713

International Conference on the Peaceful Uses of Atomic Energy. 2nd, Geneva, 1958

Материалы совещания ученых, посвященного 10-летию изобретения радиоактивных изотопов (Reports of Scientists on the Tenth Anniversary of the Discovery of Radioactive Isotopes). Moscow, Atomizdat, 1959. 968 p. (Series: It's True, vol. 6) 8,000 copies printed.

Eds. (title page): G.V. Khar'yakov, Academician, and I.I. Novikov, Corresponding Member, USSR Academy of Sciences; Ed. (inside book): Z.B. Andreyenko; Tech. Ed.: Z.D. Andreyenko.

PURPOSE: This book is intended for scientists, engineers, physicians, and biologists engaged in the production and application of atomic energy to peaceful uses; for postgraduate students and non-graduate students of higher technical schools where nuclear science is taught; and for the general public interested in atomic science and technology.

CONTENTS: This is volume 6 of a 6-volume set of reports delivered by Soviet scientists at the Second International Conference on the Peaceful Uses of Atomic Energy held in Geneva from September 1 to 13, 1958. Volume 6 contains 12 reports on: 1) modern methods for the production of stable radioactive isotopes and their labeled compounds, 2) research results obtained with the aid of isotopes in the field of chemistry, metallurgy, mining, building, and agriculture, and 3) dosimetry of ionizing radiation. Volume 6 was edited by: G.V. Khar'yakov, Candidate of Technical Sciences, V.N. Prusakov, Candidate of Chemical Sciences; and V.V. Shadrin, Candidate of Medical Sciences. See 807/2001 for titles of volumes of the set. References appear at the end of the articles.

16. Biber Galt, A.V., V.I. Kopylov, and V.I. Slonimskiy. Cobalt Sources of High Intensity for Radiative Action (Report No. 2234) 200
17. Gurev, M.G., Ye. Ye. Kovalov, and V.I. Popov. Gamma Radiation Inside and Outside Extended Sources (Report No. 2008) 211
18. Agladov, K.K., M.A. Bek, V.V. Kochubev, Ye.G. Orlovskaya, I.V. Yershova, and K.A. Petrichuk. Systems of Radiometric Measurement of Radioactive Isotopes (Report No. 2087) 227
19. Agladov, K.K., V.P. Kashtin, V.V. Kopylov, and V.V. Gurev. Application of Nuclear Spectroscopy Methods to Beta and Gamma-ray Dosimetry (Report No. 2503) 237
20. Khar'yakov, G.V., V.I. Gol'danskiy, and V.S. Ryzhov. Instrument for Measuring Small Sources of High-energy Neutrons (Report No. 2383) 244
21. Chubakov, A.A., V.I. Polikarpov, and V.A. Rubenova. Measuring and Analyzing Air Contamination by Low Concentrations of Aerosol Alpha Emitters (Report No. 2159) 248
22. Zaimskiy, O.V., V.I. Voznesenskiy, and O.A. Smol'tsina. Photocopythesis Studies by Quantitative Radiometric Methods (Report No. 2157) 260
23. Bakitin, Ye.Ye. and A.V. Kraylov. Studying the Transfer, Distribution, and Transformation of Certain Physiologically Active Compounds in Plants (Report No. 2153) 274
24. Gurev, I.I., Ye.Ye. Kravtsov, and A.Ye. Petrov-Spiridonov. Rhythm of Absorption and Secretion in Roots (Report No. 2235) 285
25. Abramovskiy, A.I., and V.A. Shitakovskaya. Effect of the Rhythmic Micro-organisms on the Absorption and Secretion of Phosphorus and Sulfur by the Seedling Roots of Woody Plants (Report No. 2312) 306
26. Khar'yakov, G.V., and V.D. Pustovarov. Absorption of Phosphorus Tracers by Cultivated Plants in Relation to Their Resistance to Cold (Report No. 2313) 315
27. Andreyenko, Z.D., A.V. Vozvrodin, V.A. Polchukova, and A.V. Buzynskiy. Some Results of Using Radioactive Isotopes for Plant Protection (Report No. 2309) 322
28. Biber Galt, A.V., and V.I. Kopylov. The Effect of Radioactive Isotopes on the Growth of Microorganisms and on the Resistance of Plants to Cold (Report No. 2308) 329

BIBERGAL', A.V.

New method of calculating dose rates of radiation from finite sources in the absorbing medium. Biofizika, 4 no.3:375-378 '59.  
(MIRA 12:7)

1. Institut biologicheskoy fiziki AN SSSR, Moskva  
(GAMMA RAYS,  
dos., calculation according final radiation source in  
absorbing medium (Rus))



21(8)

AUTHORS:

Bibergal', A. V., Korotkov, M. M., Ratner, T. G.

SOV/89-7-3-7/29

TITLE:

Some Principles of Calculating and Using Strong Radiation Sources

PERIODICAL:

Atomnaya energiya, 1959, Vol 7, Nr 3, pp 244-251 (USSR)

ABSTRACT:

It is shown experimentally that in many cases approximated calculations are justified for the dose rate and the build-up factor of  $\gamma$ -systems, especially in the case of short distances between source and the irradiated object ( $\leq 100$  cm). The experiments are carried out with point, linear, and cylindrical  $\text{Co}^{60}$ - and  $\text{Cs}^{137}$ -sources of various thicknesses. The experimentally found results are graphically recorded and compared with the theoretically calculated curves. On the whole good agreement was found. The following measuring results are shown graphically: Build-up factor for water and the  $\gamma$ -radiation of point  $\text{Co}^{60}$ - and  $\text{Cs}^{137}$ -sources, dependence of the dose rate of a linear  $\text{Co}^{60}$ -source in water on the distance between the source and the place of irradiation, comparison of the dose rate of a linear source and the dose rate in the center of a

Card 1/3

SOV/89-7-3-7/29

## Some Principles of Calculating and Using Strong Radiation Sources

cylindrical  $\text{Co}^{60}$ -source in water. Dependence of the dose rate of a linear source ( $\text{Co}^{60}$ ) in air on the distance between source and place of irradiation. Dependence of the dose rate within a cylindrical source ( $\text{Co}^{60}$ ) in the air on the source diameter. Dependence of the dose rate in air within a chamber for objects ( $d = 30$  cm) on the diameter of the  $\text{Co}^{60}$ -source located in water. Dependence of the dose rate in water within a chamber for objects ( $d = 30$  cm) of the dose rate of the  $\text{Co}^{60}$ -source in water. Dependence of the dose rate in water within a chamber for objects ( $d = 30$  cm) on the diameter of the  $\text{Co}^{60}$ -source, which is in the air. From all measurements and comparisons between experimental and theoretical calculations the following conclusions may be drawn: for all practical cases of calculating  $\gamma$ -systems it is sufficient to take multiple scattering into account by means of the build-up factor, which may be represented by the sum of two exponential functions. If a uniform dose field is required in irradiation, the most rational method is to homogenize the dose field of extended sources by means of

Card 2/3

SOV/89-7-3-7/29

Some Principles of Calculating and Using Strong Radiation Sources

additional filters. These filters must, in each case, be calculated separately. If objects with a density  $\leq 1$  and a thickness  $< 40$  cm are to be irradiated, the use of a  $\text{Cs}^{137}$ -source is more productive than that of a  $\text{Co}^{60}$ -source. There are 10 figures and 13 references, 8 of which are Soviet.

SUBMITTED: March 4, 1959

Card 3/3

21(8), 21(10)

AUTHOR: Bibergal', A. V.

SOV/89-7-3-22/29

TITLE: A New Graphical-analytical Method of Calculating the Dose Field of Extended Sources

PERIODICAL: Atomnaya energiya, 1959, Vol 7, Nr 3, pp 281-284 (USSR)

ABSTRACT: By means of approximation methods the equations to be solved are reduced to elementary or tabulated functions. In this way numerical integration is avoided. For an infinitely thin rectangular surface of finite dimensions, which is used as a source, the dose rate for different distances from the source is theoretically deduced. Also for the case in which the plane source is located in the absorptive medium itself and multiple scattering must be taken into account, the dose rate is determined by means of a formula. As a special case, an ellipse-shaped and line source was dealt with. The formula derived could in some cases be checked by means of data obtained experimentally or by numerical integration. A deviation of only less than 5% was found. The following of the existing curves deserve special mention:  
a) Distribution of the dose rate over a rectangular  $\text{Co}^{60}$ -source, for the case in which the source is in water or in the air.

Card 1/2

SOV/89-7-3-22/29  
A New Graphical-analytical Method of Calculating the Dose Field of Extended Sources

b) Distribution of the specific linear activity along a fictive linear source, which is the equivalent to an ellipse-shaped source (different axial ratios). There are 6 figures and 5 references, 4 of which are Soviet.

SUBMITTED: March 4, 1959

Card 2/2

BIBERGAL, A V

~~SECRET~~

PHASE I BOOK EXPLOITATION SOV/5410

Tashkentakaya konferentsiya po mirnomu ispol'zovaniyu atomnoy energii. Tashkent, 1959.

Trudy (Transactions of the Tashkent Conference on the Peaceful Uses of Atomic Energy) v. 2. Tashkent, Izd-vo AN UzSSR, 1960. 449 p. Errata slip inserted. 1,500 copies printed.

Sponsoring Agency: Akademiya nauk Uzbekskoy SSR.

Responsible Ed.: S. V. Starodubtsev, Academician, Academy of Sciences Uzbek SSR. Editorial Board: A. A. Abdullayev, Candidate of Physics and Mathematics; D. M. Abduramulov, Doctor of Medical Sciences; U. A. Arifov, Academician, Academy of Sciences Uzbek SSR; A. A. Borodulina, Candidate of Biological Sciences; V. N. Ivashev; G. S. Ikramova; A. Ye. Kiv; Ye. M. Lobanov, Candidate of Physics and Mathematics; A. I. Nikolayev, Candidate of Medical Sciences; D. Nishanov, Candidate of Chemical Sciences; A. S. Sadykov, Corresponding Member, Academy of Sciences USSR, Academician, Academy of Sciences Uzbek SSR; Yu. N. Talanin,

Card 1/20

176

Transactions of the Tashkent (Cont.)

SOV/5410

Candidate of Physics and Mathematics; Ya. Kh. Turakulov, Doctor of Biological Sciences. Ed.: R. I. Khamidov; Tech. Ed.: A. G. Babakhanova.

PURPOSE: The publication is intended for scientific workers and specialists employed in enterprises where radioactive isotopes and nuclear radiation are used for research in chemical, geological, and technological fields.

COVERAGE: This collection of 133 articles represents the second volume of the Transactions of the Tashkent Conference on the Peaceful Uses of Atomic Energy. The individual articles deal with a wide range of problems in the field of nuclear radiation, including: production and chemical analysis of radioactive isotopes; investigation of the kinetics of chemical reactions by means of isotopes; application of spectral analysis for the manufacturing of radioactive preparations; radioactive methods for determining the content of elements in the rocks; and an analysis of methods for obtaining pure substances. Certain

Card 2/20

Transactions of the Tashkent (Cont.)

SOV/5410

instruments used, such as automatic regulators, flowmeters, level gauges, and high-sensitivity gamma-relays, are described. No personalities are mentioned. References follow individual articles.

TABLE OF CONTENTS:

RADIOACTIVE ISOTOPES AND NUCLEAR RADIATION  
IN ENGINEERING AND GEOLOGY

Iobanov, Ye. M. [Institut yadernoy fiziki UzSSR - Institute of Nuclear Physics AS UzSSR]. Application of Radioactive Isotopes and Nuclear Radiation in Uzbekistan

7

Taksar, I. M., and V. A. Yanushkovskiy [Institut fiziki AN Latv SSR - Institute of Physics AS Latvian SSR]. Problems of the Typification of Automatic-Control Apparatus Based on the Use of Radioactive Isotopes

9

Card 3/20



- Transactions of the Tashkent (Cont.) SOV/5410
- Leshchinskiy, N. I., G. N. Lokhanin, and A. S. Shtan' [Glavatom - Main Administration for the Utilization of Atomic Energy]. Organization of Laboratories for Experiments Using Radioactive Substances 132
- Bibergal', A. V., N. I. Leshchinskiy, M. M. Korotkov, and O. G. Arakelov. Development of a Transportable Gamma-Plant for Seed Irradiation Before Sowing 148
- Artmeladze, I. D., A. V. Bibergal', and T. V. Tsotskhladze [Institut fiziki AN GruzSSR - Institute of Physics AS GruzSSR]. Experimental Semi-Industrial Gamma-Plant for Radiation Processing of Agricultural Products in Georgia 155
- Bibergal', A. V., N. I. Leshchinskiy, U. Ya. Margulis, and V. G. Khrushev. [Ministerstvo zdravookhraneniya - Ministry of Health USSR]. Some Problems of Design and Construction of High-Capacity Gamma-Plants 164

Card 9/20

PHASE I BOOK EXPLOITATION SOV/5366

Bibergal', A. V., V. I. Sinitsyn, and N. I. Leshchinskiy

Izotopnyye gamma-ustanovki (Isotopic Gamma-Ray Sources) Moscow, Atomizdat, 1960. 137 p. 4,000 copies printed.

Ed. (Title page): B. M. Isayev. Ed.: V. V. Pereverzev. Tech. Ed.: Ye. I. Mazel'.

PURPOSE: This book is intended for specialists working with strong radiation sources.

COVERAGE: The book is a purported first attempt to deal systematically with the whole complex of problems in radiation technique and equipment. Present-day methods of designing gamma emitters of various configurations are discussed, and examples of the calculation of the individual characteristics of strong gamma-ray sources given. There are appendixes to facilitate design calculations. Chs. I to III and V were written by the authors jointly, while Ch. IV was written by A. V. Bibergal'. References follow each chapter.

~~Card 1/4~~

PHASE I BOOK EXPLOITATION SOV/5330

Bibergal', Anatoliy Viktorovich, Usher Yakovelevich Margulis, and Yevgeniy Ivanovich Vorob'yev

Zashchita ot rentgenovskikh i gamma-luchey (Protection From X- and Gamma Rays) 2d ed., rev. and enl. Moscow, Medgiz, 1960. 273 p. 10,000 copies printed.

Ed. (Title page): K. K. Aglintsev, Professor; Ed.: D. M. Alekseyev; Tech. Ed.: N. I. Lyudkovskaya.

PURPOSE : This book is intended for the general reader who has no special training in physics, and for those who are working near radiation sources.

COVERAGE: The authors discuss an important phase of the theory of protection against radiation, i.e., against the harmful effects of x-rays and  $\gamma$ -rays. The preface contains a brief introduction to atomic physics. Material on dosimetry and the monitoring of protection against x-rays and  $\gamma$ -rays necessary to an understanding of problems of protection is also included.

Card 1/8

Protection From X- and Gamma Rays

SOV/5330

The book focuses main attention on protection problems themselves, dealing in detail with the passage-mechanism of x-rays and  $\gamma$ -rays through matter, principles of design, and the properties of materials used for protection. Protective structures and installations are also described, and examples of design and design nomograms are given. There is also some information on the biological effects of radiation. The present work represents an attempt to collect, systematize, and present in detailed and orderly fashion the considerable number of articles on problems of radiation protection which have appeared in the periodical literature to date. The second edition is an improvement over the first edition, inasmuch as the material has been reworked and supplemented with new material, and some material of a general character has been eliminated. Ch. I to III and Section 4 of Ch. IV were written by U. Ya. Margulis; A. V. Bibergal' wrote Ch. IV (excepting Section IV), V, VI, and VII; Ye. I. Borob'yev wrote Ch. VIII; A. V. Bibergal' and U. Ya. Margulis selected and compiled the material for the appendices. There are 65 references: 38 Soviet (including 5 translations), 26 English, and 1 German.

Card 2/8

BIBERGAL', A.V.

Gamma-ray unit for chronic irradiations in radiobiological experiments.  
Biofizika 5 no. 5:628-630 '60. (MIRA 13:10)

1. Institut biologicheskoy fiziki AN SSSR, Moskva.  
(GAMMA RAYS—APPARATUS AND SUPPLIES)

S/089/60/008/04/08/009  
B113/B017

AUTHORS: Bibergal', A. V., Leshchinskiy, N. I.

TITLE: On the Problem of the Accuracy of the Computation of the Build-up Factor of Gamma Radiation in Absorbing and Scattering Media of Small Thicknesses

PERIODICAL: Atomnaya energiya, 1960, Vol. 8, No. 4, pp. 372-373

TEXT: For computing the build-up factor  $B_0(h\nu, \mu_0 x, z) = A_1 e^{-\alpha_1 \mu_0 x} + A_2 e^{-\alpha_2 \mu_0 x}$  (1).  $\alpha_1, \alpha_2, A_1, A_2$  = coefficients for various gamma radiation energies and nuclear charge numbers of the z absorbing and scattering media,  $\mu_0$  linear attenuation factor of a narrow  $\gamma$ -beam in the given medium, x = layer thickness of the medium. According to this formula exact values for the factors taken from Refs. 1-5 are obtained for materials with high atomic weight; with water e.g. only for layers

VB

Card 1/2

On the Problem of the Accuracy of the  
Computation of the Build-up Factor of Gamma  
Radiation in Absorbing and Scattering Media  
of Small Thicknesses

S/089/60/008/04/08/009  
B113/B017

thicker than 60 cm. With  $x < 60$  cm,  $f(x) = e^{-\mu_0 x} B(h\nu, \mu_0 x, z)$  (especially  
for a  $\text{Cs}^{137}$  source) exceeds the value given in Refs. 4-5. This is  
explained by an inaccurate selection of the coefficients in (1) for the  
given range. Hence for computing the attenuation of gamma radiation of  
a  $\text{Cs}^{137}$  source in materials of small thickness it is preferable to  
determine  $f(x)$  from data according to Ref. 6. There are 1 figure and  
6 references: 3 Soviet and 3 American.

SUBMITTED: November 13, 1959

✓B

Card 2/2

9.6150  
27.9500

4312

30365

S/205/61/001/004/031/032  
D208/D303

AUTHORS: Bibergal', A. V., and Nikulin, Yu. P.  
TITLE: An integral condenser dosimeter  
PERIODICAL: Radiobiologiya, v. 1, no. 4, 1961, 633-635

TEXT: Existing dosimetric apparatus is usually based on radio amplifying systems and often operates unstably. In view of this, the authors developed an integral condenser dosimeter in which the measuring section used an electrostatic C-95 (S-95) voltmeter, class 0.1, which gave direct measurement of the potential on the chamber. The instrument has four measuring ranges and works on the principle of capacity discharge under the action of radiation on the ionization chamber. The operating principle can be seen from Fig. 1 and the circuit diagram from Fig. 3. The initial voltage on the chamber is about 450 v, the final voltage (with the needle in the extreme position) is about 250 v, thus ensuring a saturation current with all commonly encountered dosal intensities of X-ray or gamma-radiation. With appropriate regulation, linearity of

Card 1/0 2



An integral condenser...

30365  
S/205/61/001/004/031/032  
D298/D303

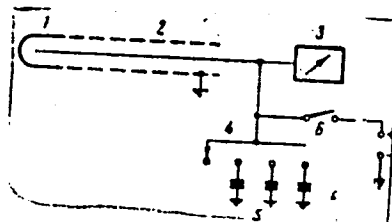
the instrument's scale is achieved with an accuracy of up to  $\pm 2\%$ .  
During 6 - 8 months of observation, the instrument's readings changed  
by no more than  $\pm 3\%$ . There are 3 figures.

ASSOCIATION: Institut biologicheskoy fiziki AN SSSR (Institute of  
Biophysics, AN USSR), Moscow

SUBMITTED: April 12, 1961

Fig. 1. Schematic diagram of the integral  
condensator dosimeter

Legend: 1--ionization chamber; 2--cable;  
3--electrostatic voltmeter; 4--switch;  
5--additional capacitor; 6--high voltage  
supply.



Card 2/2

BIBERGAL', A.V.; TSETSKHLADZE, T.V.; ARTMELADZE, I.D.

The experimental semi-industrial gamma-ray source GUEP-20,000.  
Trudy Inst.fiz.AN Gruz.SSR 8:63-74 '62. (MIRA 16:2)  
(Gamma rays--Industrial applications)

BIBERGAL', A.V.; YEMEL'YANOV, K.N.; KOROTKOV, M.M.; LESHCHINSKIY, N.I.;  
RATNER, T.G.

Transportable  $\gamma$ -ray apparatus GUPOS - Cs<sup>137</sup> -800 for presowing  
irradiation of seeds. Atom. energ. 12 no.2:159-160 F '62.  
(MIRA 15:1)  
(Radiation sterilization)

BIBERGAL', A.V.; PERTSOVSKIY, Ye.S.; KUZIN, M.Ye.

Gamma-ray source for grain irradiation. Atom. energ. 16 no.1:84-86 Ja  
'64. (MIRA 17:2)

BIBERGAL', A.V.

✓-irradiation sources in biological experiment. Radiobiologiya  
5 no.4:612-615 '65. (MIRA 18:9)

1. Institut biologicheskoy fiziki AN SSSR, Moskva.

БИБЕЛОВ Л. А. В. РАЙСЕР Л. О.

Calculation of nonuniformity in dosimetric substantiation of  
gamma therapy. Med. rad. 30 no.7:34-36 J1 '65. (MIRA 18:9)

1. Institut biologicheskoy fiziki AN SSSR, Moskva.

BIBERGAL', Leonid Anatol'yevich; NAGI, Ervin Alekseyevich;  
SOLOMONIK, Samuil Solomonovich; KRANIKHFEL'D, L.I., red.

[Cables and wires for electronic apparatus] Kabeli i provoda dlia elektronnoi apparatury. Moskva, Energiia,  
1964. 255 p. (MIRA 17:9)

BIBERGAL, S.; DABKOWSKI, J.; PIASZEWSKA, J.

Effect of histamine on cutaneous vasomotor reactions. Przegł.  
derm., Warsz. 2 no.4:501-518 Oct-Dec 1952. (CLML 24:2)

1. Of the Hospital imienia E. Sonnenberg, M.D. (Head--Physician  
--S. Bibergat), Lodz.



BIBERGAL, Stanislaw

Non-gonorrheal urethritis. Przegl.derm.Warlsz. 5 no.6:479-490  
Nov.-Dec. '55.

1. Ze Szpitala im. E. Sonnenberga w Lodzi. Ordynator: dr S.  
Bibergal. Lodz, Dzpital im. dr E. Sonnenberga, Tramwajowa 15.  
(URETHRITIS)

BIBERGAL, Stanislaw; BOROWICZ, Krystyna; WIERZBOWSKA, Alina  
~~WIERZBOWSKA, Alina~~

Granuloma fungoides as a disease of the reticuloendothelial system.  
Polski tygod.lek. 10 no.23:757-761 6 Je '55.

1. Ze Szpitala Chorob Skornych im.Sonnenberga; ordynator: dr.S.  
Bibergal; z Zakladu Anatomii Patologicznej A.M. w Lodzi; kierownik:  
prof. dr med. A Pruszczyński i z Pracowni Hematologicznej Panstw.  
Spitzla Klinicznego im. N. Barlickiego; kierownik: dr. med. A.  
Wierzbowska) Lodz, Tramwojowa 15

(MYCOSIS, FUNGOIDES, pathology  
RE system)

(RETICULOENDOTHELIAL SYSTEM, pathology  
in mycosis fungoides)

BIBERGAL, Stanislaw (Lodz, Szpital im. E. Sonnenberga, ul. Tramwajowa 15.)

Case of coexistence of lupus erythematosus with lesions on the face & scalp & Darier-Roussy sarcoids on the extremities. Przegl. dermat., Warsz. 8 no.3:321-328 May-June 58.

1. Ze Szpitala im. Dr E. Sonnenberga w Lodzi Ordynator: dr St. Bibergal.  
(SARCOIDOSIS, case reports  
Darier-Roussy sarcoidosis of legs with lupus erythematosus of face & scalp (Pol))  
(LUPUS ERYTHEMATOSUS, DISCOID, case reports  
face & scalp with Darier-Roussy sarcoidosis of legs (Pol))  
(LEGS, dis.  
Darier-Roussy sarcoidosis with lupus erythematosus of face & scalp, case report (Pol))  
(SCALP, dis.  
same)

BIBERGAL, Stanislaw; KUCZYNSKA, Teresa

Result of griseofulvin therapy of 56 cases of mycoses. Przegl. dermatol.  
49:239-241 '62.

1. Szpital Skórny dla Dzieci w Łodzi, Ordynator: dr St. Bibergal.  
(GRISEOFULVIN)

BIBERGAL, S.I., podpolkovnik meditsinskoy sluzhby

Air disinfection in dressing and operation rooms in surgical hospitals.  
Voen.-med.zhur. no.9:80 S '51. (MLRA 9:9)

(AIR-PURIFICATION)

(SURGER, ASEPTIC AND ANTISEPTIC)

JOURNAL, 3. 1.

A New Method of Obtaining Bacteriological Cultures.

VOYENNO-MEDITSINSKIY ZHURNAL (MILITARY MEDICAL JOURNAL), No 3, 1955. p. 75

BIBERGAL, S.I., podpolkovnik meditsinskoy sluzhby

Quick method of staining blood smears. Voen.-med. zhur. no.9:  
58-59 S '55.

(MLRA 9:9)

(STAINS AND STAINING (MICROSCOPY))

GUREVICH, Yu.K.; LITVAK, L.L.; BIBERGAN, B.Ya.; BLEKH, Ye.Ya.;  
BARABASH, D.V.

Observations on the treatment of various forms of syphilis with  
bicillin. Vest.derm.i ven. 34 no.12:31-33 '60.

1. Iz Odesskogo oblastnogo kozhno-venerologicheskogo dispensera  
(glavnyy vrach I.M. Koltun). (MIRA 14:1)  
(SYPHILIS) (PENICILLIN)



DIBERDAN, D.

A book on tanks for tractor drivers and chauffeurs. Moskva, Voen. izd-vo, 1949  
118 p. (50-22066)

UG446.5.B5

BIBERGAN, Ye., inzh.

Cylinder shovel and the tubular well. Sel' stroi. 12 no.3:18 Mr '58.  
(Artesian wells) (Excavating machinery) (MIRA 11:3)

KALOMFIRESCU, A. [Calomfirescu, A.]; ABABEY, R.; OLARYU, T.; BIBERI, S.

Epidemiological investigations on infectious hepatitis in Bucharest.  
Zhur. mikrobiol. epid. i immun. 29 no.12:59-62 D '58. (MIRA 12:1)

1. Iz Tsentral'noy sanitarno-epidemiologicheskoy stantsii (Rumyniya).  
(HEPATITIS, INFECTIOUS, epidemiology,  
in Rumania (Rus))

IVAN, I.M.; BIBERI, S.; ROTTMANN, Elian.

~~HEPATITIS, INFECTION~~  
Diagnosis of inframicrobial epidemic hepatitis by the hemagglutination inhibition reaction. Stud. cercet. inframicrobiol., Bucur. 6 no.3-4:405-412 July-Dec. 1955.

(HEPATITIS, INFECTIOUS, diagnosis  
hemagglut. inhib. test in viral hepatitis)

(HEMAGGLUTINATION  
inhib. test in diag. of viral hepatitis)

IVAN, I. M.; BIBERI-MOROIANU, Sanda; NICHITA, O.

Epidemiological study of viral epidemic hepatitis in a quarter of Bucharest. Stud. cercet. inframicrobiol., Bucur. 7 no.1-2: 35-49 Jan-June 56.

(HEPATITIS, INFECTIOUS, epidemiology  
in Bucharest, incidence & mortal. of viral hepatitis)

CALOMFIRESCU, Al.; ABABEI, Roza; OLARU, Tr.; BIBERI, Sanda

Epidemic hepatitis in Bucharest in the period 1952-1955; epidemiological aspects. Stud. cercet. inframicrobiol., Bucur. 8 no.2:155-171 1957.

1. Comunicare prezentata la Institutul de inframicrobiologie al Academiei R.P.R., in sedinta din 3 septembrie 1956.

(HEPATITIS, INFECTIOUS, epidemiology  
in Rumania, incidence in Bucharest in past three years)

NICOLAU, St. S., academician; BIBERI-MOROIANU, S.; CAJAL, N.

Certain statistico-epidemiological data on the evolution of  
inframicrobial epidemic hepatitis in Rumania. Stud. cercet.  
inframicrobiol., Bucur. 10 no. 4: 401-416 '59.  
(HEPATITIS, INFECTIOUS, statistics)

SPINU, I.; BIBERI-MOROIANU, S.

Epidemiological considerations on the evolution of poliomyelitis in Rumania before and after oral vaccination with attenuated live virus. Stud. cercet. inframicrobiol. 13 no.2:175-186 '62.

1. Comunicare prezentata la Sesiunea stiintifica a Institutului de poliomielite si encefalita al Academiei de Stiinte Medicale din U.R.S.S.

(POLIOMYELITIS immunology)



SPINU, I.; BIBERI-MORCIANU, S.; POPA, S.

Considerations on the practice of immunizing children against transmissible diseases in Rumania. Stud. cercet. inframicrobiol. 13 no.5:593-606 '62.

1. Directia Generala sanitaro-antiepidemica din Ministerul Sanatatii si Prevederilor Sociale, Bucuresti.

(COMMUNICABLE DISEASE CONTROL) (VACCINATION)

DUCA, M.; DUCA, Eugenia; EIBERE-VOROCIARU, Sanda; MARIN, AL.; MURGHEA, Tanta

Specificity of the West-Nile hemagglutinating antigen, extracted with reagents prepared in the country, in the detection of infections with arthropod-borne encephalitis viruses of the B group. Stud. cercet. inframicrobiol. 15 no.1:31-35 '64.

DUCA, M.; DUCA, Eugenia; BIBERI-MORIANU, Sanda; VANCEA, Georgeta;  
HANDRACHE, Ludmila; TEOLOROVICI, Gr.; POPA, S.; BUZDUGAN, I.;  
MARDARI, A.; OANA, C.; DUMITRESCU, D.; IVAN, A.; BUSILA, I.  
Immuno-epidemiological research on encephalitis transmitted  
by sheep ticks. Stud. cercet. inframicrobiol. 15 no.3:  
231-239 '64.

EIBERI-MOROYANU, Sanda [Eiberi-Moroianu, Sanda]

Epidemiological considerations regarding the distribution of  
epidemic hepatitis in Rumania. Vop.med.virus. no.9:154-160  
'64. (MIRA 18:4)

1. Previtepidemicheskii otdel Ministerstva zdorovokhraneniya i  
seksual'nogo obespecheniya, Rumynskaya Narodnaya Respublika.

RUMANIA

616.934-08(R)

SPINU, I., Lect, BIBERI-MOROIANU, Sanda, Dr, POPA, S., Dr, and ROMAN, V., Dr. Work performed at the Central State Health Inspectorate (Inspectoratul Sanitar de Stat Central) of the Ministry of Health and Social Welfare (Ministerul Sanatatii si Prevederilor Sociale).

"Considerations Concerning the Program for the Eradication of Diphtheria in the Socialist Republic of Rumania."

Bucharest, Microbiologia, Parazitologia, Epidemiologia, Vol 11, No 4, Jul-Aug 66, pp 289-300.

Abstract [Authors' English summary modified]: The authors present the concept on which Rumania's diphtheria control program was based and summarize the main measures taken and results obtained. The campaign was based on an interruption of the pathogenetic process rather than elimination of the pathogenetic microorganism; it involved primary immunization followed by 4 to 5 re-immunizations of the entire population below 18 years of age, and systematic control of the immunity obtained by means of the Schick test. Includes 2 tables and 3 figures.

1/1

- 12 -

BIBERNAN, L. M.

"Diffusion of Resonance Radiation," Dokl. Ak Nauk SSSR, 1940, 27, 920-925.

Mathematical. A strict deduction leads to a convergent expression for the diffusion coeff., instead of a divergent one as found by Kenty (Physical Rev., 1932, ii, 42, 823). An expression for the effective life of an atom in the excited state gives vals. in substantial agreement with the experimental data of Zemansky (A., 1927, 491)

Diffusion of radiation in a gas discharge. F. A. Dolanov, I. M. Buzman, and V. A. Fabinant (*Bull. Acad. Sci. U.S.S.R. Ser. Phys.*, 1961, 8, 95-98). Differences between diffusion phenomena involving particles and photons are discussed, and a method of taking photon diffusion into account in the theory of radiation from gas discharges is outlined. J J R

Biebelman, L. M.

Meberman, L. M. On the theory of the diffusion of resonance radiation. Akad. Nauk SSSR. Zhurnal Eksper. Teoret. Fiz. 17, 416-426 (1947). (Russian. English summary)

In this paper the problem of the emission of resonance lines by the combined effects of excitation by radiation and quenching by collisions is considered. For the number of excited atoms  $n_a(x)$  at a point  $x$  in a plane-parallel medium, the integral equation

$$(*) \quad n_a(x) = \lambda \int_0^x n_a(\xi) K(|x-\xi|) d\xi + \lambda \eta B(x)$$

is derived, where

$$K(y) = \frac{1}{2} k d \pi^{-1} \int_0^\infty \int_0^\infty u^{-2} \exp \{ -2\omega^2 - k d y e^{-u^2} \} du d\omega,$$

$\lambda$  is related to the mean life  $\tau$  in the excited state and the coefficient of collisional quenching,  $k d$  is the optical thickness of the medium at the center of the line and  $B(x)$  is a certain known function. The integral equation (\*) is solved by a numerical process which involves its replacement by a system of linear equations.

S. Chandrasekhar.

Source: Mathematical Reviews, 1948, Vol 9, No. 2



BIBERMAN, L.

PA 43/43T98

USSR/Physics

Feb 1948

Resonance - Radiation  
Diffusion

"Approximation Method for Calculating Diffusion of  
Resonance Radiation," L. Biberman, Moscow Energetics  
Inst imeni V. M. Molotov, 32 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LIX, No 4

Describes experiments resulting in establishment of  
method to calculate diffusion of radiation. Empha-  
sizes approximate character of method, but points out  
that it will be most useful for simultaneous calcula-  
tion of radiation diffusion and mutual exchanges be-  
tween several levels. Submitted by Academician S. I.  
Vaylov, 29 Nov 1947.

43T98

BIBERMAN, L. M.

IA 170T103

USSR/Physics - Absorption, Resonance  
Mercury Vapor

Jun 49

"Transparency of Mercury Vapors to Mercury's Resonance Line 2537 Å for Small Optical Densities of the Absorbing Layer," L. M. Biberman, I. M. Gurevich, All-Union Electrotech Inst

"Zhur Eksper i Teoret Fiz" Vol XIX, No 6, pp 507-14

Measures subject transparency and compares data with results of the theory of diffusion of resonance radiation. Submitted 13 Jan 49.

170T103

BIBERMAN, L. M.

✓5395 AECU-1r-2845  
 EMISSIVE DISTURBANCE OF THERMODYNAMICAL  
 EQUILIBRIUM IN A PLASMA. L. M. Biberman. Trans-  
 lated from Zhur. Fizmat. Tiz. 15, 594-595 (1949).  
 12p. No. 7

The departure of a plasma from its equilibrium state is studied due to the emission of radiation. The distribution of excited states is obtained as a function of the coordinates for small deviations from equilibrium. The decline of the concentration of excited states toward the source boundary, even at assumed constant temperature, results in self-reversal of emission lines when the source is small and in the appearance of absorption lines when the source occupies a half-space. (auth)

Moscow power Eng Inst

1ST AND 2ND ORDERS		PROCESSES AND PROPERTIES INDEX	
N		8	
<p>554 Diffraction of Electrons Moving in Succession. L. Riberger, N. Sushkin, and V. Fabrikant. <i>Doklady Akad. Nauk S.S.S.R.</i> 66, 185-6(1949)(in Russian).</p> <p>In real experiments on electron diffraction, powerful beams are involved. However, theoretically, the process is an intermittent one, and the wave properties belong to every single electron. An experiment is described here, in which the diffraction of intermittently released electrons is realized by using beams of very low intensity in a modified electron microscope. By spreading a strong beam, a curve of photographic darkenings, as a function of electron densities, was first obtained, with the aid of which the number of the diffraction electrons could afterwards be determined. The diffraction beam used was exceedingly weak: the mean time interval between two electrons following each other through the instrument was <math>2.4 \times 10^{-4}</math> sec, while the time spent by an electron in traversing the instrument was <math>3 \times 10^4</math> times shorter than the mean interval between two successive arrivals of electrons at a given point of the plate; therefore, the probability of a simultaneous traversing of the instrument by two electrons was very small. The diffraction pictures thus obtained (using crystals of magnesium oxide) were identical with those produced by an intensive electron beam.</p>			
ASB-5LA METALLURGICAL LITERATURE CLASSIFICATION			
SOURCES		CITATIONS	
<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100</p>		<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100</p>	

BIBERMAN, L., M.,

Pa. 150T4

USSR/Astronomy - Stellar Radiation

21 Jul 49

"Equations of Radiation Transfer (Exchange) in Stellar Atmospheres," L. M. Biberman, Moscow Power Eng Inst imeni V. M. Molotov, 3 pp

"Dok Ak Nauk SSSR" Vol LXVII, No 3

Introduces an integrodifferential equation for radiation intensity at a given frequency as a function of coordinates and direction and an integral equation for the concentration of disturbed atoms. Submitted by S. I. Vavilov 14 May 49.

150T4

BIBERMAN, L. M.

155T64

USSR/Physics - Electron Scattering  
Electron Microscope Dec 49

"Scattering of Electrons in Thin Layers," L. M. Biberman, Ye. N. Vtorov, I. A. Kovner, N. G. Sushkin, B. M. Yavorskiy, Moscow State U Iment V. M. Molotov, 4 pp

"Dok Ak Nauk SSSR" Vol LXIX, No 4

Results of experiments using electron microscope EM-100 to measure angular distribution of electrons passed through thin film and scattered in the interval from  $3 \cdot 10^{-4}$  to  $3 \cdot 10^{-2}$  radian showed measurements in this interval are quite reliable.

155T64

USSR/Physics - Electron Scattering (Contd) Dec 49

However, number of 60 Kv-electrons scattered was much greater than number calculated for very small angles ( $3 \cdot 10^{-3}$  radian). Submitted by Acad S. I. Vavilov 6 Oct 49.

155T64

BIBERMAN, I. M.

PA 156T99

USSR/Physics - Radiation, Absorption      Feb 50  
Mercury.

"Absorption of Resonance Radiation and the  
Formation of Metastable Atoms in Mercury Va-  
por," I. M. Biberman, I. M. Gurevich, All-  
Union Elec Eng Inst, 9 pp

"Zhur Eksper i Teoret Fiz" Vol XX, No 2

Measured transparency of layer of mercury va-  
por for resonance radiation at high pressures.  
Observed transparency minimum, which is ex-  
plained by influence of Holmark widening.  
Also measured electric currents arising during

156T99

USSR/Physics - Radiation, Absorption      Feb 50  
(Contd)

exposure of mercury vapor to light. Suggests  
mechanism of the phenomenon is connected with  
formation of metastable atoms and with ex-  
traction by them of electrons from the elec-  
trodes. Submitted 5 Aug 49.

156T99

BIBERMAN, L. M.

PA 195T64

USSR/Physics - Electron Microscope Jul/Aug 51

"Theory of Multiple Electron Scattering," L. M. Biberman

"Iz Ak Nauk SSSR, Ser Fiz" Vol XV, No 4,  
pp 424-427

✓ This and the following article are parts of lectures by Biberman, presented during Conference of Electron Microscopy: "Interaction of Electrons With Object in Electron Microscope." He discusses elastic electron scattering for small angle  $\cos \theta \sim 1$ . Derives suitable eqs and makes use of Thomas-Fermi model.

195T64



PA 195T65

BIBERMAN, L. M.

USSR/Physics - Electron Microscope Jul/Aug 51

"Possibility of Observation of Atom in Electron Microscope," L. M. Biberman

"Iz Ak Nauk SSSR, Ser Fiz" Vol XV, No 4,  
pp 429-433

(Cf. previous article, *ibid.*) Subject possibility depends on necessary conditions being met simultaneously. Resolving power of  $10^{-8}$  cm in microscope may produce diffraction pattern of mol or atom and should be attained at  $5 \cdot 10^5$  ev. It is also necessary that the atom stay motionless and the electrons be numerous enough for observation.

195T65

PA 174T88

BIBERMAN, L.

USSR/Physics - Electrical Discharge Jan 51

"Measuring the Parameters of High-Frequency  
Electrodeless Discharge with Two Probes," L.  
Biberman, B. Panin, All-Union Ord of Lenin  
Electrotech Inst imeni Lenin

"Zhur Tekh Fiz" Vol XXI, No 1, pp 12-17

Proposes method for measuring subject parameters  
which involves taking v-amp characteristics  
with aid of 2 identical probes. Temp and concn  
of electrons are detd from results obtained in  
processing characteristics. Authors were as-  
sisted by Prof B. N. Klyarfel'd and Prof V. A.  
Fabrikant. Submitted 23 Jan 50.

174T88

BIBERMAN. I.M.

Radiation

Theory of light emanation in isotropic media  
Zhur. eksp. i teor. fiz., 23, no. 1, 1952

BIBERMAN, L.

USSR/Physics - Bibliography

Jan 52

"Bibliography," V. A. Fabrikant, L. Biberman

"Uspekhi Fiz Nauk" Vol XLVI, No 1, pp 134-138

D. N. Lazarev, "Ultraviolet Radiation and Its Application" Leningrad/Moscow, 1950, 119 pp. Favorable review.

S. Chandrasekhar, "Radiation Transfer" Oxford, 1950, 393 pp. Allegedly appropriated methods of V. A. Ambartsumyan. Despite some deficiencies still useful. [sic]

List of 62 new Russian books in physics, pp 139-144.

209T104

BIBERMAN, L.M., kand.tekhn. nauk, dots.

Connection between the solutions of Fredholm's second kind integral equations distinguished by domains of integration. Trudy MBI no.13: 97-102 '53. (MIRA 11:4)

1. Moskovskiy energeticheskiy institut im. V.M. Molotova, Kafedra fiziki. (Integral equations)

BIBERMAN, L. M.

USSR/Physics - Photographic Latent Image

Card 1/1 : Pub 146-14/18

Author : Biberman, L. M. and Kovner, I. A.

Title : The theory of the photographic action of electrons

Periodical : Zhur. eksp. i teor. fiz. 26, 234-241, February 1954

Abstract : An expression is deduced for the probability of formation of a latent image in a photoemulsion crystal taking into account the independent and collective actions of electrons which have passed through the crystal. The theoretical dependence of the density of blackening on the intensity of the electron beam for a constant number of electrons falling on a unit area of the photoemulsion during the time of exposure qualitatively coincides with experimental results. The authors thank Prof. V. A. Fabrikant and K. S. Bogomolov for their interest and suggestions.

Institution : Moscow Power Engineering Institute

Submitted : June 1, 1953

BIBERMAN, L. M.

Effect of reabsorption on the width of spectral lines.  
L. M. Biberman and E. M. Novodvinskaya. *Soviet Phys.*  
Doklady 1, 5-8 (1958) (English translation). See C.A. 50,  
14341c. R. M. R.

BIBERMAN, L. M.

Kinetics of development of photographic emulsions exposed by electrons of intermediate energies. L. M. Biberman and I. A. Ponomarev (V. M. Molotov Inst., Serpukhov, Moscow). *Zhur. Nauch. Prikl. Fiz.* 1, 331-3 (1956); *ibid.* 1, 50, 524. Photographic films were exposed to 22, 40, and 80 e.k.v. electron beams of intensities from  $1.5 \times 10^{-12}$  to  $1.15 \times 10^{-10}$  amp./sq. cm. and developed 1-30 min. Resulting  $\Delta s$  were measured and are tabulated and graphed with respect to time of development. For low-intensity beams the time required for complete development ( $T$ ) was 28 min. for 60-80 e.k.v. electrons (I) and 14 min. for 0-30 e.k.v. ones (II). For high-intensity beams  $T$  was 34 min. for I and 20 min. for II. The induction period for both series was 4 min. for I and less than 0.5 min. for II. These results confirm the hypothesis that the latent image in a given emulsion grain is produced at low intensities by incident electrons acting singly, and at high intensities (where the time interval between in-

cident electrons is less than the relaxation time) by incident electrons acting collectively.

J. W. Lowenberg, Jr.



BIBERMAN, L.M., kandidat tekhnicheskikh nauk.

Computing multiple reflections in illumination engineering.

Svetotekhnika 2 no.5:1-4 S '56.

(MLRA 9:11)

1. Moskovskiy energeticheskiy institut.  
(Lighting)

BIBERMAN, L.M.

SUBJECT

USSR / PHYSICS

CARD 1 / 2

PA - 1541

AUTHOR

BIBERMAN, L.M., BEKLENKO, B.A.

TITLE

The Application of the Theory of Chance Processes to the Transport Phenomena of Radiation.

PERIODICAL

Zurn.eksp.i teor.fis, 31, fasc.2, 341-342 (1956)  
Issued: 10 / 1956

The present work deals with the motion of the photon as a chance process at the following very general initial conditions: Isotropic medium: its characteristics may depend on the time and the coordinates; the photon can be scattered, absorbed, and newly emitted by the atom, and it may also be annihilated by a collision of the second kind or by absorption. The polarization of radiation and the motion of the atom which is excited by a photon is not taken into account.

The function  $f_{v_1}^{v_2}(\vec{r}_1, \eta_1, v_1, t_1; \vec{r}_2, \eta_2, v_2, t_2) dV_2 d\eta_2 dv_2$  which serves as a basis of the above deliberations, represents the probability that the photon (with the frequency  $\gamma_1$ , the velocity  $v_1$ , and the totality  $\eta_1$  of the direction cosinus) which at the moment  $t_1$  is at the point  $\vec{r}_1$ , is to be found within the elementary domain  $dV_2$  (which surround the point  $\vec{r}_2$ ). On the occasion of the introduction of various photon velocities the free ( $v=c$ =velocity of light) photons as well as the photons which are absorbed by atoms ( $v=0$ ) are taken into account. By suitable selection of the function  $f_{v_1}^{v_2}$  it is possible to consider the motion of

Žurn.eksp.i teor.fis, 31, fasc.2, 341-342 (1956) CARD 2 /,2 PA - 1541

the photon as a chance process of the mixed type without aftereffects. Therefore the function  $f_{v_1}^{v_2}$  itself must satisfy the generalized MARKOV'S equation:

$$f_{v_1}^{v_2}(1;2) = \sum_{v_3}^1 \int f_{v_1}^{v_3}(1;3) f_{v_3}^{v_2}(3;2) dv_3 d\eta_3 d\gamma_3. \text{ Here } f_{v_1}^{v_2}(1;2) \text{ is an}$$

abbreviation for the above mentioned function. The two integrodifferential equations by KOLMOGOROV-FELLER for the processes of the mixed type are explicitly written down.

If the distribution of the sources of radiation and of the collisions of the first kind in the investigated volume  $V$  are known, it is easily possible, with the help of the functions  $f_{v_1}^{v_2}$ , to determine the distribution of the concentration of the excited atoms and the intensity distribution of radiation in space and in time. Thus, the complete system of equations for the non-steady process of radiation transport in an isotropic medium is obtained by means of the theory of the chance processes. The first equation by KOLMOGOROV-FELLER permits the determination of a complete system of equations for the required probability densities.

INSTITUTION: Moscow **Energetic** Institue.

BIBERMAN, L. M.

USSR/ Physics

Card 1/1      Pub. 22 - 9/43

Authors      : Biberman, L. M., and Novodvorskaya, Ye. M.

Title        : Effect of reabsorption on width of spectral lines

Periodical   : Dok. AN SSSR 106/1, 35-38, Jan 1, 1956

Abstract    : The dependence of the width of spectral lines on the parameters of a light source is discussed and a formula, expressing the width of a spectral line, is presented. Based on this formula diagrams of the widening of spectral lines were constructed. A study of the diagrams led to the suggestion that the dependence of the widening of spectral lines should be looked for in the concentration of radiating atoms which, in turn, can be determined through evaluation of the so-called optical density ( $k_0 l$ ) where the  $l$  is the extent of the source in the direction of the observer (the thickness of the radiating source). Five references: 1 Germ., 1 Jap. and 3 USSR (1928-1954). Graphs; table.

Institution : Moscow Energetic Institute imeni V. M. Molotov

Presented by: Academician G. S. Landsberg, July 8, 1955

BIBERMAN, L.M.

51-4-22/26

AUTHOR: Biberman, L. M.

TITLE: On Determination of the Oscillator Strength by Direct Measurement of the Spectral Width of a Source of Finite Optical Density. (Ob opredelenii sily ostsillyatora putem neposredstvennogo izmereniya shiriny spektral'noy linii istochnika konechnoy opticheskoy plotnosti.)

PERIODICAL: Optika i Spektroskopiya, 1957, Vol.III, Nr. 4, pp.397-399. (USSR)

ABSTRACT: The present communication proposes a new method of determination of the oscillator strength, based on Ref.1, where it was shown that in a wide range of optical densities the spectral emission line width depends linearly on optical density. A similar dependence was earlier discovered (Ref.2) in the study of the line widths of certain elements introduced as impurities into an electric arc. According to Ref.1 the slope of the linear portion may be, with sufficient accuracy, regarded as independent of the ratio of the dispersion and Doppler widths. This very simple dependence of the line width

Card 1/4

51-4-22/26

On Determination of the Oscillator Strength by Direct Measurement  
of the Spectral Width of a Source of Finite Optical Density.

on the optical density makes it possible to propose the following method for the oscillator strength determination. (A) The line width of emission by a uniform source is measured as a function of the number of absorbing atoms in the ray path. (B) The slope of the linear part of the dependence so obtained is found. (C) The oscillator strength is then found to be directly proportional to the slope mentioned above (Eq.2 on p.397). The oscillator strength in Eq.2 is based on the assumption that broadening due to interaction of similar particles is small. Such interaction is important when, with increase of concentration of the absorbing atoms, the line width of emission in an elementary act will be no longer linearly, but approximately quadratically dependent on the optical density. The method proposed is applicable only if the experiment ensures a small value of the resonance broadening. When the resonance broadening is dominant the author derives,

Card 2/4

51-4-22/26

On Determination of the Oscillator Strength by Direct Measurement  
of the Spectral Width of a Source of Finite Optical Density.

using the effective cross-section for resonance interaction from Ref.4, a linear dependence of the line width on the concentration of emitting atoms and not on the optical density. The line width is now given by a different expression (Eq.6 on p.398). The expression of the line width for the case of resonance broadening given in Eq.5 makes it possible to obtain a ratio useful in the study of the effective cross-section of resonance broadening. This ratio is given by Eq.7. From Eq.7 the author deduces that a resonance form of the spectral line which is not distorted by re-absorption occurs when the geometrical path of the ray in the optical source is less than its wavelength. At higher optical densities the form of the line of absorption may be distorted because of the intrinsic emission of the absorbing layer. There are 6 references, all of which are Slavic.

Card 3/4

51-4-22/26

On Determination of the Oscillator Strength by Direct Measurement  
of the Spectral Width of a Source of Finite Optical Density.

ASSOCIATION: Moscow Power Institute imeni V. M. Molotov.  
(Moskovskiy energeticheskiy institut im. V.M. Molotova.)

SUBMITTED: March 29, 1957.

AVAILABLE: Library of Congress.

Card 4/4



Biberman, L. M.

51-6-15/25

AUTHORS: Biberman, L. M., and Romanov, V. Ye.

TITLE: On the Mechanism of Formation of Continuous Background in the Emission Spectrum of Hot Gases.  
(O mekhanizme obrazovaniya nepreryvnogo fona v spektre izlucheniya goryachikh gazov.)

PERIODICAL: Optika i Spektroskopiya, 1957, Vol. III, Nr. 6, pp. 646-648. (USSR)

ABSTRACT: It is usually assumed that continuous background in the emission of hot gases is due to recombination and radiation of electrons in the Coulomb fields of ions. There is, however, a systematic difference between the theoretical results calculated assuming the above process and experimental values. Such a difference is particularly noticeable in high-pressure arcs. The calculation of theoretical results based on the assumption of recombination emission (Ref.1) is thus only approximate. The present authors show that the systematic difference referred to above is due to neglect of radiation of electrons when moving in

Card 1/4

51-6-15/25

On the Mechanism of Formation of Continuous Background in the  
Emission Spectrum of Hot Gases.

the field of neutral atoms (the so-called free-free transitions). The present authors regard the latter process as more important than recombination and radiation in the fields of ions. Chandrasekhar and Breen (Ref.12) discuss the problem of radiation of an electron in the field of a hydrogen atom in their studies of solar atmosphere. In a gas containing more complex atoms radiation of electrons in the atomic fields is even more effective than in hydrogen gas, and it is this process that accounts essentially for background emission in hot gases. Following Ref. 12 the authors neglect exchange and polarization of atoms by the fields of moving electrons, and they calculate the coefficient of absorption per one neutral atom and one bar of electron pressure, assuming Maxwell distribution of electron velocities. Born approximation for the wave-functions was used, and the charge density in a complex atom was approximately

Card 2/4

51-6-15/25  
On the Mechanism of Formation of Continuous **Background** in the  
Emission Spectrum of Hot Gases.

represented by a hydrogen-like distribution. It was found that the coefficient of absorption for a free-free transition of an electron in a field of a mercury atom is about two orders higher than the corresponding coefficient for hydrogen. This increasing absorption is due to a quadratic dependence of probability of absorption on the intensity of atomic field. As a concrete example, mercury spectrum of very-high-pressure lamps was studied. The table on p.648 gives the experimental values (col.6), and theoretical values obtained by Unsöld (Ref.1), Elenbaas (Ref.4) and the present authors (cols. 7,8 and 9 respectively) of the optical density of emission of four mercury lamps. Because of strong frequency dependence of the theoretical formula obtained by the present authors the values given in the table refer to only one wavelength of 6500 Å. The table shows clearly that the best agreement between experiment and theory is shown by

Card 3/4

On the Mechanism of Formation of Continuous Background in the  
Emission Spectrum of Hot Gases. 51-6-15/25

the theoretical values obtained by the present  
authors. The authors thank Professor V. A.  
Fabrikant for his interest and criticism. There  
is 1 figure, 1 table and 14 references, of which  
3 are English, 10 German and 1 Dutch.

ASSOCIATION: Moscow Power Institute. (Moskovskiy energeticheskiy  
institut).

SUBMITTED: March 29, 1957.

AVAILABLE: Library of Congress.

Card 4/4

VUL'FSON, K.S., prof.; GUREVICH, M.M., prof.; MESHKOV, V.V., prof.; NILENDER, R.A., prof. YUROV, S.G., kand. tekhn. nauk; SOKOLOV, M.V., prof.; BIBERMAN, I.M., kand. tekhn. nauk; BUTAYEVA, F.A., kand. tekhn. nauk; IVANOVA, N.S., kand. tekhn. nauk; SUSHKIN, N.G., kand. tekhn. nauk.

Valentin Aleksandrovich Fabrikant; on his 50th birthday. Svetotekhnika 3 no.12:24-25 D '57. (MIRA 11:1)  
(Fabrikant, Valentin Aleksandrovich, 1907-)

B. BERMAN, L. M.

24(7) PLANE I BOOK EXPLOITATION 807/1700

L'ov. Universitet

Materials X Vsesoyuznogo Soveshchaniya po spektroskopii, 1956.  
 t. II. Atomnaya spektroskopiya [Materials of the 10th All-Union  
 Conference on Spectroscopy, 1956. Vol. 2: Atomic Spectroscopy]  
 /Dov. Izd-vo L'vovskogo Univ., 1958. 568 p. (Series: Itar  
 Vuzhskiy sbornik, v. 4(9)). 3,000 copies printed.

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Foreword: This book is intended for scientists and researchers in  
 the field of spectroscopy, as well as for technical personnel  
 using spectrum analysis in various industries.

COVERAGE: This volume contains 177 scientific and technical studies  
 of atomic spectroscopy presented at the 10th All-Union Confer-  
 ence on Spectroscopy in 1956. The studies were carried out by  
 members of scientific and technical institutes and include  
 extensive bibliographies of Soviet and other sources. The  
 studies cover many areas of spectroscopy: spectral analysis of  
 atomic and molecular gases, plasmas, liquids, solids, and earths;  
 vacuum production physics and technology of gas discharge,  
 optics and spectroscopy; abnormal dispersion in metal vapors,  
 spectroscopy and the combustion theory; spectrum analysis of ores  
 and minerals; photographic methods for quantitative spectrum  
 analysis of metals and alloys; spectral determination of the  
 hydrogen content of metals by means of isotopes, tables, and  
 atlases of spectral lines; spark spectrographic analysis;  
 statistical study of variation in the parameters of calibration  
 curves; determination of traces of metals; spectrum analysis in  
 metallurgy; thermochemistry in metallurgy; and principles and  
 practice of spectrochemical analysis.

Card 2/31

Materials of the 10th All-Union Conference (Cont.)	807/1700
Turkin, Yu. I. Self-absorption of Light in a Source and Its Effect on the Relative Intensities of Components of the Hyperfine Structure	83
Sitnik, G.P. Absolute Photometry of the Continuous Sun Spectrum	85
Tutsis, A.P. Generalized Method of Pok's Self-consistent Field and Intensities of Its Application	86
Vapnitskiy, L.A. Computing Wave Functions and Oscillator Energies With an Electronic Computer	89
Petrashen', M.I., and I.V. Abarenkov. Semiempirical Method for Calculating Oscillator Energies	92
Berkarev, G.P. Theory of Atom Excitation by Electrons	97
Biberman, L.M., and B.A. Valenko. Radiation Diffusion in and Discharge of Cylindrical Configuration	99
Card 7/31	

24.3200

S/058/60/000/006/038/040

AOC5/A001

Translation from: Referativnyy zhurnal, Fizika, 1960, No. 6, p. 360, # 15347

AUTHORS: Biberman, L.M., Veklenko, B.A.

TITLE: γ Radiation Diffusion in the Discharge of Cylindric Configuration

PERIODICAL: Fiz. sb. L'vovsk. un-t, 1958, No. 4, (9), pp. 99-102

TEXT: The Biberman theory developed earlier (Zh. eksperim. i teor. fiz., 1947, Vol. 17, # 416), which takes into account the variation in the photon frequency, is applied to the calculation of the diffusion of radiation from the discharge of cylindric configuration, which is of considerable practical significance. The equation obtained is solved by the Bogolyubov method. Besides this solution, the solution is considered which was obtained by the more approximate method proposed by Biberman (Dokl. AN SSSR, 1948, Vol. 59, p. 659). The discrepancy between the computational values and the values obtained experimentally lies within the limits of the experimental accuracy. ✓C

ASSOCIATION: Mosk. energetich. in-t (Moscow Power Engineering Institute)

K.S. Vul'fson

Translator's note: This is the full translation of the original Russian abstract.

Card 1/1

SOV/51-7-4-21/32

AUTHORS: Siberman, L.M., Yerkovich, S.P. and Soshnikov, V.N.

TITLE: On the Probability of a Transition in the Schumann--Runge Band System of the O<sub>2</sub> Molecule.

PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, Nr 4, pp 562-563 (USSR)

ABSTRACT: Keck, Camm and Kivel (Ref 1) measured the absolute intensity of emission by oxygen at 4100°K at wavelengths of 3000-5000 Å. They compared the experimental data with an approximate expression for the intensity of emission given in an earlier paper (Ref 2) and concluded that the oscillator strength for the Schumann--Runge band system of O<sub>2</sub> is  $f = 0.015$ ; this value is much smaller than that deduced from absorption by cold O<sub>2</sub>, which was given as  $f = 0.16-0.20$  (Refs 3, 4). Keck et al explained this large difference between the two values of the oscillator strength to be due to dependence of the probability of an electronic transition on internuclear distances. The conclusions of Keck et al are questioned by the present authors, who compare the experimental data of Keck et al with a stricter expression for the intensity of emission  $I_{\lambda}$  (Eq 3). Using the experimental values of  $I_{\lambda}$  and Eq (3), the authors calculated  $R_e^2(\lambda)$ , where  $R_e(\lambda)$  is the electronic moment of a transition, which may depend on internuclear distance. It

Card 1/2



SOV/51-7-4-21/32

On the Probability of a Transition in the Schumann--Runge band system of the  $O_2$  Molecule

was found that  $R_g^2(\lambda)$  falls monotonically from 1 atomic unit at  $\lambda = 3000 \text{ \AA}$  to 0.5 atomic unit at  $5000 \text{ \AA}$  (see the dashed curve in a figure on p 563). These values of  $R_g^2(\lambda)$  correspond to an oscillator strength  $f = 0.1-0.2$ , which agrees quite well with the values of  $f$  deduced from absorption (Refs 3, 4) and with theoretical estimates (Refs 5, 9). Using the calculated values of  $R_g^2(\lambda)$  and a set of Franck--Condon multipliers  $q(v', v'')$ , Eq (3) was found to yield the distribution of intensities in the Schumann--Runge system between  $3000$  and  $5000 \text{ \AA}$  at  $2000$ ,  $4000$ ,  $4100$  and  $6000^\circ K$ . These intensities are plotted as continuous straight lines in the figure on p 563. Acknowledgment is made to I.T. Yakubov who supplied his set of calculated Franck--Condon factors. There are 1 figure and 11 English references.

SUBMITTED: February 3, 1959

Card 2/2

10(6), 10(7)

SOV/56-37-1-26/64

AUTHORS: Biberman, L. M., Veklenko, B. A.

TITLE: On Radiation Processes in Front of a Shock Wave (O radiatsionnykh protsessakh pered frontom udarnoy volny)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 1(7), pp 164-169 (USSR)

ABSTRACT: The present paper deals with the absorption of a radiation which causes the excitation of atoms or molecules. The subsequent process of unsteady diffusion of the radiation is also considered. It is shown that a wave of excited atoms or molecules is formed in front of the shock wave. The first part of the paper is concerned with the initial equation and its approximate solution. A plane shock wave with the temperature  $T$  is assumed to move at the velocity  $v$  in the direction of the  $x$ -axis. The authors then set up the equation for the distribution of the excited atoms in space and time. They are only interested in the concentration of the atoms excited up to the resonance level, and they also consider the possibility of extinction by kinetic processes. For the concentration  $n_a(x,t)$  of the excited atoms in front of the shock wave rather a long equation is written down. The

Card 1/3

On Radiation Processes in Front of a Shock Wave SOV/56-37-1-26/64

solution of this integrodifferential equation involves great mathematical difficulties, and can hardly be attained in a general form. L. M. Biberman (Ref 3) showed that in integral equations with a kernel indicated here good results are attained by a method of approximation (which is reduced to the introduction of the term of effective life of the excited state of the atom). The corresponding solution is explicitly written down, and discussed in the second part of the paper. If there is no extinction in cold gas in front of the shock wave, a wave of excited atoms is gradually formed with a concentration equal to Boltzmann's concentration (at the temperature  $T$ ). This result holds for any velocity  $v$ , because in the exciting radiation there is a quantity of photons which corresponds to the "wings" of the absorption line. The last part deals with the propagation of the shock wave in an atomic gas. In an atomic gas, the interaction of the radiation with the atoms is characterized by the absorption line, the course of which usually depends on the superposition of a Doppler effect and a shock- or resonance interaction. The authors then estimate the distribution of the excited atoms in front of the shock wave in argon. A diagram illustrates the concentration of argon atoms in the state  $3p^5(2P_{1/2}^0)4s$  as a function

Card 2/3

On Radiation Processes in Front of a Shock Wave SOV/56-37-1-26/64

of the distance from the wave front. At distances  $x < 1$  cm, the extinction by electrons predominates. There are 1 figure. and 7 references, 4 of which are Soviet.

ASSOCIATION: Moskovskiy energeticheskiy institut  
(Moscow Power Engineering Institute)

SUBMITTED: January 29, 1959

Card 3/3